CHALLENGES IN INTEGRATING SUSTAINABILITY CONCEPTS INTO URBAN DEVELOPMENT PROJECTS

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DECLARATION

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Dr. (Mrs.) Chandanie Hadiwattage

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ABSTRACT

Challenges in Integrating Sustainability Concepts into Urban Development Projects

Major cities have been condensed after decades of rapid urban development. The rapid urban developments of industrial activities have transformed cities into concrete jungles causing severe impacts on the natural ecosystem. All cities are facing issues such as air pollution, water pollution, and heat island effect. Therefore, sustainable development is crucial for all urban development projects hence the project manager's role is essential to be evolved. A project manager performs a crucial role during the project planning, execution, monitoring, control, and closing of the project. This study mainly distinct the role of project managers' challenges in sustainable urban development projects.

The literature survey was carried out to explore challenges in integrating sustainability concepts into urban development projects. Then the empirical study identified the practices in Urban Development Authority (UDA) of Sri Lanka to achieve sustainable development. UDA which is a foremost public sector organisation engaged in planning and sustainable development. Interviews were used to identify the project manager's role and other professions involvements in selected cases.

Findings reveal that, adequate research wants to be performed to get to know about the background and requirements before initiating any projects. A life cycle cost-benefit analysis will help to understand challenges and barriers in a more precise way. This information can be presented to top management highlighting all the benefits. It will help to influence the management towards sustainable development initiatives. Proper education and communication with employees are crucial in getting their support for sustainable urban development projects.

Further, this research helps to identify project manager's role under the social, economical, and environmental pillars. Enhance people's quality, conservation of architectural, social, cultural, and historical value, and provide job opportunities are main social benefits. Increase market value of the buildings, tourist attraction, monthly colleting huge amount of rent money are important economical benefits. When consider environmental sustainability these cases are more concerned about the use 5s system, prevention of natural resources usage, enhance safe and health work environment, and implement waste management system.

Keywords: *Project Manager, Sustainable Concept, Urban Development Projects*

DEDICATION

I dedicate this to my family, parents, many friends, and all teachers without whom it was almost impossible for me to complete my dissertation work.

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CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABBREVIATIONS

Abbreviation		Description
CIA	-	Central Environmental Authority
CMC	-	Colombo Municipal Council
ICSBE	-	International Conference on Sustainable Built Environment
LEED	-	Leadership in Energy and Environmental Design
PM	-	Project Management
PMS	-	Project Managers
UDA	-	Urban Development Authority

CHAPTER 01

1.1 Background

Most commonly publish a determination of sustainable development is that sustainable development is "development that meets the needs of future generations without compromising their ability to meet their own needs" (Bruntland, 1987). Yet, most of the definitions do not explicitly define sustainability development or sustainability, 28% of announcements concern about this clarification a hypothetical starting point for the World Commission on Environment and Development (Bruntland, 1987).

Ensuring a better worth of life for all households in the general public through enhancement of ecological, societal, and financial exposure has been at the heart of sustainable development for decades. The green building concept is also part of the environmental sustainability. High performance building called as green building or Green, or as builders and designers have practiced sustainable building for centuries (Delnavs, 2012).

The construction industry is a dominant sector that can be achieved sustainable development. Sustainable construction meets adaptations to new processes, working methods that require new technology in the process and take into account various risks. Therefore, it is important to learn new roles, actors, and characters to overcome the challenge (Delnavs, 2012).

The speedy process of urbanisation has formed excessive pressures on different governments, mainly in developing nations of the world where public institutions are not ready to handle the growing change that come with such pressure (Arcila, 2008). Sustainability must be transformed into an important, word-famous element in the discussion of urban planning. In the century of urbanisation, the built environment of cities plays an important role in locally and broadly improving sustainability. (Taylor, 2016).

Even towns, huge municipality, and little neighborhoods do not, start immediately: they are the results of proper and heedful planning by project manager, surveyors, civil engineers, architect, builders and environmental planners (Brooks, 2017). Urban development can be called as incorporation of these professionals. As a result, the Urban Development Authority (UDA) was launched in Sri Lanka for the development of development of environmental standers and policies, submitting development plans, including capital project for bringing to comprehensive planning and for physical development of specific urban surroundings and preparing programs to improve the environmental development in urban surroundings by giving technological setting up services (UDA action plan, 2017).

After decades of rapid growth, large cities are heavily populated. Rapid urbanization and the development of industrial activities have turned cities into solid forests, which have a huge impact on the natural ecosystem. All cities are facing issues such as water, pollution, air pollution, and heat island effect. Therefore, sustainable development is crucial for all urban development projects (Le Blanc, 2015).

Since the project manager has a specific place at the level of the project, the role of the PM in integrating sustainability in the project should be given special attention among other stakeholders. Project management means completing a project with specific funds, time duration, and using given resources. The project is closed at the achievement of project goals and objectives. Therefore is called as a short-term effort to produce a distinctive production, services, or outcome with a defined inception and last (Delnavs, 2012).

As expressed by Tharp and Silvius (2013) that "the connection between project management and sustainability picks up in between project management and sustainability are picking up trust and that the most of the researches were reported in the last four (04) years (Silvius & Tharp, 2013, p. xix). The rising interest of concerns of sustainability in project management is motivating, anyhow, it has some challenges to takes concepts of sustainability in understanding by specific activities that have to perform, even though to, to convey in actual, working phrases

(Briassoulis, 2001). The incorporated of sustainability also differ as per circumstance (van Marrewijk, 2003). With insights and knowledge developing, Silvius (2013) states that an outlined is needed.

Accordingly, the study purposes to come up with this outline by creating awareness about the challenges in integrating sustainability concepts into urban development projects.

1.2 Problem Statement

As stated by the Brundtland (1987), Sustainability is basis of addressing current needs and wants without undermining to next generation's capability to face their wants. The sustainability framework consists of three main indicators such as cultural, environmental, and social.

Further, poor management system effects to create the environmental, economical, and social problems in project management practices in public sector organizations (Abbasi & AL-Mharmah, 2000). Therefore, project managers have many challenges when implementing sustainable concepts into the project. Anyhow, sustainability also allows organisations to frame decisions on the extended period economic, social, and human consequences, rather than short-term benefits. Therefore, government authorities are now focusing on sustainability concept.

Further, Schlichter (1999) stated that sustainable project management directs to boost public sector organisation's efficient and effective. Therefore, the project manager is the core person who involved in the project to achieve project's goals and objectives within the given time period. As stated (Bakhshi, 1991) the sustainability concept is novel concept for lees development countries and the public sector is placed in high rank about the less awareness of sustainability concepts. Accordingly, this concept is more challengeable concept when applying into the public sector.

However, the pace of urban population is mainly affected by urban development as well as infrastructure development projects. Therefore project manager is a notable person for these projects when bringing the sustainability concept into the urban projects. Accordingly, the role of PMs needs special particular interest from other shareholder hence PMs have different situations at the stages of the project. Hence, the aim of this research how PMs can contribute to sustainable urban development projects.

1.3 Aim and Objectives

1.3.1 Aim

This study's purpose is investigating the project manager's essential performance and challenges in integrating sustainability concepts into urban development projects.

1.3.2 Objectives

- Critically review the significance of the project manager in sustainable urban development project management
- Appraise the requirements of sustainable concept integration to urban development projects
- Explain the challenges for the project manager's role in sustainable urban projects
- Describe the responsive role of the project manager in addressing the challenges of integrating sustainability into urban development projects

1.4 Methodology

The detailed literature review was conducted to recognise the role of project managers in sustainable urban projects by referring books, journal articles, newspaper articles, and other government publications

Empirically, case studies were carried out by interviewing Consultants, Architect, Project Managers, Engineers, Facilities Managers, and Project Planners who were involved in Urban Development Projects to identify their role for sustainable urban development projects.

1.5 Chapter Breakdown

CHAPTER 01 :- Overview of research, which contains context of research analysis, objectives, aim, scope, boundaries, and the methods used to fulfill the series of goals.

CHAPTER 02 :- Analysis of literature, it includes the theoretical context.

CHAPTER 03 :- Methodology of research, it addresses the research techniques of the research proposal, implementation of its theoretical models explaining the aim of the study, research environment, approach of the research and data analysis process.

CHAPTER 04 :- Analysis of results, that provides form of analysis.

CHAPTER 05 :- Conclusions and Recommendation, it observes with results, suggestions and guidance for some more study.

CHAPTER 02

2.0 Literature Review

2.1 Introduction

This chapter reviews associated published articles accompanying with the challenges and the role of project managers in integrating sustainability concepts into urban development projects. The literature results of this study give a higher level of perception of the project manager's role in sustainable urban development projects. Therefore, the project manager is the key person on a project that faced challenges from the beginning to closure.

2.2 Sustainability Concept Application in the Urban Development Projects

With rapid urban development, urban development authority is trend of focusing on sustainability concept (UDA Action plan, 2017). The concept of sustainability and sustainable construction projects are discussed in detail in the next sections.

2.2.1 The Concept 'Sustainability'

Sustainable development can noticeable as the development to direct exiting needs, without damaging capacity of next generation capacity to fulfill their own wants (CIBSE 2004). Sustainability links consideration for studying of natural ecosystems to the societal problems facing human culture. As directed by Rehmann (2010), sustainability development consider main three (03) pillars, which assist with sustainable development as (i) atmospheric, (ii) economics, and (iii) societal. Basis of three (03) pillars in Figure 2.1, stand in for optimising sustainable remediation or sustainable development.

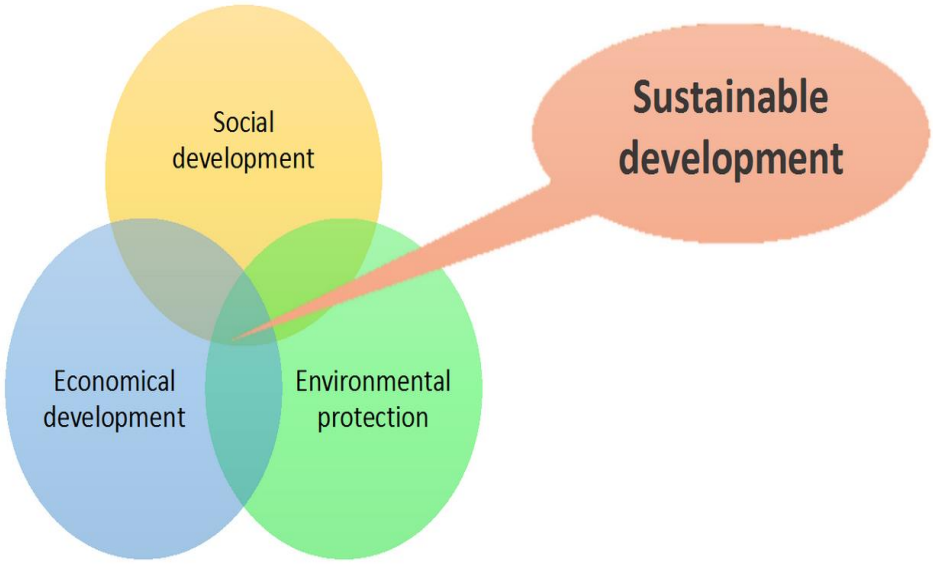

Figure 2.1.Sustainable development pillars

As stated by Wanamaker (2018), the environmental sustainability becomes a measure of the harvesting of renewable energy sources, reduction of non-renewable resources and production of emission that can be continued forever. Yet it is not possible to pursuing the renewable resource continually when it is not sustainable. The rate of regeneration (Sustainable yield) surpasses should not be exceeded at the producer level of renewable resources. (Wanamaker 2018).

The pollution is, the amounts of generating waste from projects that do not surpass environmental assimilation (effective waste removal) capability. Reductions of non-renewable resources are non-renewable resources that want similar development of renewable substitutes for that resource (ICSBE-2010).

The economy's capacity to maintain a given stage of economic production indefinitely is defined as the economic sustainability (Du & Kang, 2016).

Commonly social sustainability is determined as the capacity of social structure, such as nation, to work indefinitely at a given degree of social welfare. This level can be specified with regard to Homosapiens' goal of optimising the superiority of life for those who are living with their problems (Daly, 1992).

2.2.2 Sustainable Construction Projects

As stated McGraw-Hill (2006), the combination of proper designing, building, operation, and recycling is sustainable. Eliminating the built its elimination of the built surroundings in an environmentally-friendly, energy-efficient, and competitive way are used interchangeable to the excessive acting of architecture, total building design, sustainable construction, and green building architectural designs.

Winter and Szczepanek (2009) state projects can be considered in this viewpoint as non-permanent institutions that provide vary to institutions, productivity, work procedures and policies, and capitals. Further, Turner and Müller (2003) stated of the possibility of projects being described as a temporary nature or temporary organizations, most often across organisational structures and boundaries, a defined deliverable or result, logically or preferably connected to the organisational strategy or goals, and finally specified resources and budget. Explaining the assessment of projects, a tool of change and intervention, it can be observed that a sustainable society needs a project to achieve change. It was however observed by Gareis et al (2009) that there is little consideration on sustainable development in temporary organizations such as projects and programs. Subsequently, it was resolved by Silvius and Tharp (2013) that, there is momentum in the relationship between sustainability and project management over the years, and that from the published researches in recent years. Accordingly, in section is explained about the urban development projects.

2.3. Urban Development Projects

There is no exact description about ‘urban’, it is differing from nation to nation or country to country, and its ethics also differ from country to country. Therefore, it is not easy to create exact definitions or collation. According to the report of UNICEF urban are called the areas more than 2000 people are living (worldwide it is 200-50,000 people, living area), or people who living in town or municipal council or district area, or political zone or provincial areas. The urban area depends on volume of the population, cultural and economic factors, (People who are living in

agricultural areas), and the current development of specific areas (high infrastructure facilities, road, street, electricity and water facilities, waste management). Further, in the year 2010 the UNICEF has published 3.5 billion people lived area as urban area. Some urban development projects are redeveloped, renovated projects, and refurbishment projects.

When an increasingly large amount of people in a specific area the resources that are available in that area are not sufficient to fulfil their requirements; then create a scarce and that area became as urban areas. Then urban development is essential and new developments are introduced to face this scarcity.

2.3.1 Refurbishment Projects

A building's life recurring with a series of distinct workplace packages, up keeping activities, repair, reconstruction, renewal, and rehabilitation. Renovation is portion of this sequence, occurring originally at the end of the period, external, primarily, micro-economics factors, anyhow, also have an impact of the rearranging asset value and can reorganize rehabilitation prior to the process (Geissler, 2016).

In general aim of the renovation is to enhance the usefully utilisation of a remain property by offering cot effective substitute to renovation (Markus, 1979). Through this description it is inferred that recent economic life of the building is on top of or minimal coming nearly to a close, and that a supper and longer life is viable (Bone, 1987). Anyhow, it is not all the time incident and refurbishment may be tackle to modify a sub-market or to protect a situation in an equally modified submarket.

2.3.2 Redevelopment Project

The redevelopment is a special kind of urban renewal that can study from the experiences of urban renewal and also it is the construction of a new building in the urban area (Huang, 2005). After the Second World War, several European countries, managed large-scale urban renewal activities. Even though some of them even lost

the right way during the renewal process, most of these countries accumulated many precious experiences and being the pioneer in the urban renewal filed as well. Furthermore, their involvement can be taken as references for urban village redevelopment.

Therefore, infrastructure facilities need to be expanded and further schools, markets, hospitals, and other related facilities should be considered (Pawson, 2015). Due to these reasons, urban development projects are most essential. Therefore, locally the government has formed an organisation to consider these developments as called Urban Development Authority (UDA).

In most cases urban development projects are not as other conventional projects. In general, many urban development projects are kind of incorporated and cover a variety of organisations (Engineering/ institutional strengthening) physical elements. Social, cultural consideration of society is mainly focused on developing urban projects and those projects are people-oriented and aimed to provide advantages to the society. The project fiscal activities are incomplete as all have been financed from treasury. It also considers the economic benefits and project's cross-subsidies to the urban population (Strategic plan of UDA, 2017).

When increasing the number of people who are living in urban areas, urban development is crucial. While developing the urban areas the sustainability concepts have become a vital concept in the world widely due to resource scarcity.

2.3.3 Sustainable Urban Development Projects

Sustainable development is all about managing things to meet a specific target or to achieve a goal (Primack & Sher, 2016). In other words, it can be described as, Uses of currently available resources for current needs and wants with keeping or saving to fulfill the next generation's needs (Brundtland, 1987).

Briefly, the relaxation of the present generation only and do not consider of the needs of future generations and destroy the environment with different development activities, these activities will be termed as unsustainable. In taking every action, small or big, the possible damages to the environment must be given full concern and the action must not leave behind a degraded environment. Technically, sustainable development is defined as a path of development in which no permanent and irreparable damage is done to the environment and the resources are kept intact for future generations. The earth has everything for each generation, but it depends on the proper use. The present generation can survive very well on the resources available, but they must also leave behind enough resources for future generations. A sustainable development path must not have any negative factor that is responsible for causing adverse impacts on the environment (Forum for the Future Annual Report, 2000).

Sometimes infrastructures are not sufficient in urban areas due to rapid increases in population. As a result of that, the infrastructure should be developed. When establishing the project to expand the facilities of infrastructure have to damage some resources. In the future, these will be caused to environmental impact. For instance, it can be planted trees for the use of future generations after the development of projects. The concept of non-sustainability concept is not aiming for replacement or redevelopment. Therefore, urban projects are paying attention to converting unsustainable projects into sustainable development projects.

The accomplishment of sustainability outcome is one the various reasons to be on the has a single of the various issues to be directed in the interest of users, as well as the need for conventional results timelines, budgets, and various of user crews. Therefore, project management is critical to the success of every trade project and the main purposes of project manager is ensuring an integrated design of the project and deliver the project within the specific time period (McGraw-Hill, 2006).

PMs perform as an essential change agent in ensuring that a more sustainable development process and practices are achieved. Therefore, the project manager is

performing important role in the execution of sustainable development towards urban development projects and project manager's power is high within the project.

2.4 Way Forward for Integrating Sustainability for the Urban Development Projects in Sri Lanka

Sri Lanka is a tropical country receiving the monsoon rains, tolerable varying temperatures throughout the year, ancestors had been used simple architectural concepts to design their living space to suit the internal and external environment. Therefore, the current buildings of the UDA in Sri Lanka are facing many problems, in the environment, health, socio-economic aspects (www.meteo.gov.lk).

Urban Development Authority (UDA) is expected to achieve results through converting the existing buildings to green buildings, while advancing through sustainable green concepts. It is expected to achieve the desired future Greening UDA building and much towards sustainable development by implementing the code to follow the guidelines in the designing, planning, construction, demolition reconstruction operation and maintenance throughout the building life cycle (UDA Action plan, 2017).

2.5 Approaches of Project Management

2.5.1 The Concept of Project

The project can be described in various ways in the research literature as follows,

- Project can be defined as non-permanent enterprise launched to form a distinctive product or service, the non-permanent (Temporary) path is aimed the end point of the project, and clearly states that the services or production is somewhat different from any comparable services or product (PMI, 1996, p.4).
- Project is called person effort and its stakeholders can legitimately consider when the project involves a unique scope of work based on cost and time,

with the objective of a good or service. A good or services must be developed or changed to generate helpful improvement recognised by qualitative and quantitative goals (Cooke-Davies, 2001, p.20).

- The project has been designated as a "value creation based on specifications, which is completed within a set or approved timeframe, including resources and external conditions" (Ohara, 2005, p.15).
- A project has been described as a trade case that identifies the advantages and threats of the business enterprise, designating a specific series of end results, with a short lifetime, make use of related resources with ascertained duties. (Bradley, 2002, p.14).

Considering these definitions basically, the outcome of the project or projects are especial, well- defined opening point and finishing point, are impermanent and are proceeding to achieve the institution's tactical proposes. Then impermanent formations act an important character in latest institutions and an increasing attentiveness is stated in the importance of these kinds of impermanent institutions.

2.5.2 The Concept of Project Management

This universal appropriateness of the group of companies required commence that could effectively organise this ad hoc effort, which are key to the strategic goals of the organisation. This has helped investigators and expert in the area to formulate the ways to handle the project very effectively (Mintzberg, 1983).

The key argument is that investigators consider project management to be at the heart of the mastery of smart organisations (Soderlund, 2004 a & b). The PM is an important concept for every organization and depends on the size, scope, and industry, etc. Accordingly, project management can be determined in the research literature in different ways. Some definitions are,

- Project management can be explained similar to a set of mechanism and plan of action which guide to utilize of various resources in the directness of achieving single, comprehensive, and punctual duty in time period, superiority and cost. Every duty needs a special combination of these mechanisms and that adapt to the working environment as well the life cycle from the beginning to closing stages (Oisen, 1971: Cited in Atkinson, 1999).
- Project management has been expressed as the setting up, coordinating, supervision and evaluation and managing of every feature of the project and the inspiration for every interested party for the accomplishment of their project goals securely, allocated cost, duration, as well as implementing standards (APM, 1995).
- The way of applying information, ability, mechanisms, and procures to project tasks to get together with project specifications is also called project management. PM achieves the requirements of the project at all the stages as, inception stage, execution, evaluation, control, and completion processes (PMI, 2004).
- Project management is represented by the ability to deliver as a professional mission and product of the project to achieve the specific duty by managing professional members of the group successfully together with most suitable managerial methods, mechanisms and designing it very effectively to efficient collapse for the way of execution (Ohara, 2005).

Project management can be explained as a body of knowledge that transforms images into actuality whereas Atkinson (1999) suggests, PM is probably an advance phenomenon, which will stay vague enough to be non-deficient. The present workability is called its strength (Turner,1996).

At the beginning, accomplishment of PM considers as only for the solitary project (Kartam et al. 2000). Yet, now a day, lots of institutions attached the conception of managing a project. It is necessary due to their systematic approach to project management (Morgan, 1987). It is a system for achieving stable results while

implementing latest measures and strong company method that would be utilized to control the efficiency of company (Artto et. al, 2008). As well as PM is able to be implemented all the way through company to increase individual and combining production. It is completed by creating a standardized method while sets finest actions on how to manage projects (Milosevic & Patanakul, 2005).

The project management skills, tools, knowledge, and methods are crucial for project activities as per necessities of the project. This is qualified through the functions and incorporation of PM procedure for beginning, setting up, implementation, evaluation, control, and closure (PMI, 2004). Mintzberg (1983) is expressed in Soderlund (2004b), which describes many developing constructions from the time when world-war 11 projects were serious. This extensive applying of projects in an organisation requires coming towards to effectively handle these short-term efforts that are crucial to the organisation's tactics. It leads the researches and skillful people in the industry to create and precede the project effectively. The focus of research on projects has largely been on implementation of completely single projects (Crawford et al, 2006). Project research currently covers different levels of analysis. Conceptions such as the management of projects and the management represent the current approach to project research (Soderlund, 2004 a & b).

2.5.3 The Concept of Project Manager

In project management, the Project Manager also has various descriptions. The project manager can be selected according to the awareness of the field with vast knowledge, skills and leadership pattern. According to Gaddis (1959), project manger's role is to erect the product, and the tool used by project managers to achieve project goals. The project team is a skilled full team combination of several fields. Each and every stage of a project mean from the project idea to implementation stage are used by these tools (Gaddis 1959). Meanwhile, when Gaddis publishes the report, PM was seen as someone who developed a higher technological product that can become into contact and encounter. That perspective has differed today, and the outcome of a project is no longer a physical, high-tech

creation. As per to the National Criminal Justice Reference Service (2015), the project manager's job is to design and manage the project schedule, make a smooth announcement between project crew, and identify the various threats that arise during the project and in addition to that to upgrade the entire projects, that is mean not having one task or assignment as a part of the project (NCJRS 2015). A qualified project manager is also anticipated to demonstrate to do the things in efficiency and effectiveness (Bredillet, Tywoniak, et al. 2015).

Duncan (2008) explored that a project manager is a person who has the in general liability for the successful commencement, setting up, plan, implementation, execution, managing, and closing of a project by achieving the tasks of the project.

As defined by Meredith and Mantel (2006) the person who is accountable to enhance the project's success is called project manager. The project manager is involved to prepare the preliminary budget, set the time for project stages, specified team members, set up a relationship with a client and secured the necessary funds for the project at the inception stage.

2.6 Project Manager in the Public Sector Construction Projects

Considering public sector organisation project manager is acting a major role and the purpose is bit a different comparing other sectors like private and non-government organisations. Therefore project manger's role in Urban Development Authority is very essential as Spittler and McCracken (1996) affirm that the exploration for successful management of these projects has repeated since people began to build larger projects for the general public good. The public sector needs to manage its projects with ease and at the lowest manageable value. Anyway, public sector organizations are slow in response to time and administrative culture. These are often seen as impermissible qualities and undermine effective project management. The public sector authority also understands that PM aims to ensure that the organisation's resources are used in a proper manner, even it differs from aims as

well as purposes. To accomplish these different aims combining with purposes at the minimal fees an acceptable performance that has rightly chosen.

Locally, the Urban Development Authority is the public sector organisation which is established under the Ministry of Western Development and Mega Police. Therefore, the project manager's role in UDA projects is crucial under these stages as project commencement, setting up, implementation, execution and managing, and project closure.

2.7 Project Management in Sustainable Urban Development Projects

As projected, the professional bodies of project management have perceived initially, the importance that sustainability has concerning projects (Gareis, Heumann, & Martinuzzi, 2009; Silvius, van der Brink, and Kohler, 2009). As, at the Project Management Institute's (PMI) Global Congress 2008, Europe, Russell (2008) expressed broadly of, the implications of Corporate Social Responsibility (CSR) for project managers. It was proposed that a project manager is at the forefront of new or changed activities within an organization and thus is perfectly located to impact and influence the organization's processes and operations towards more sustainability. Fundamentally the project manager role essentially demonstrates heightened responsibility (Russell, 2008). In the same way, the Association for Project Management (APM) revealed that "the planet earth is in a risky position with a range of basic sustainability threats" and "project and program managers are significantly placed to formulate assistance to sustainable management practices" (APM, 2006, p. 1-7). Also, the International Project of Management Association (IPMA) expressed that a key development in the project management profession is the accountability for sustainability required for project managers (McKinlay, 2008).

Supplication of information, expertise, mechanisms, and procures related to fulfill project needs and tasks can be defined as project management (PMBOK, 2013). Delnavaz (2012) said that proper application and incorporation of a grouped of project management processes named as i.e (i) preliminary, (ii) planning, (iii)

implementation, (iv) monitoring, and finally (v) control, and termination stages logically called as project management.

Wu et al. (2010) proposed a package of effective project management strategies to achieve the desires of green building. These effective project management packages are aimed to get an effective role for project managers. This package includes the PM processes in the project life cycle to achieve sustainable construction, the transmission of relevant goals for the different projects without missing concept of sustainability in major places in the process, construction management practices during the construction phase to achieve green goals, and feedback and documentation of the ongoing project life cycle.

Every phase of the project leads from the project manager. It means PM responsible for first selling the point out all the jobs needed to attain the project goals and on that occasion PM sequence those tasks into a schedule. Then after to achieve given project objectives, allocate the resources that needed for those tasks and schedules. Then, it is designated to collect a crew, obtaining the required devices, provisions, protecting a workplace, and all other necessary facilities.

The people who are responsible for implementing projects and arrange the payment for the services using the allocated budget also a role of project manager. Further, maintaining each and every file to keep record until the project closely and another role is dealing with risk to ensure the project's progression to assure that project crews operate efficiently according to the project calendar and allocated financially.

Then principally, as per the project leaders point of view whatever thing that relevance to the project. The project manager is the key person and handles project's subordinates when implementing project proposal. Though, PM cannot be a chairperson and PM introduced a project proposal to financial supporters or shareholders, and PM disclose to the PM on the project progresses.

Hence, the leader of the project is an extremely organised individual whom are focused on the task and intense about the project procedures. The person who has ideas about how to get works in effectively and efficiently from the people, guidance to manage people, highest ability to work under pressure to achieve project objectives. Apart from that stakeholder's skill, presenting abilities is vital. Further, the PM should aware with the systems and mechanisms that support carries on the efficient and effective project. Therefore, when consider the economic, environmental, social sustainability for urban development projects, the PM must have to play a major role to obtain the sustainable urban project.

2.8 Summary

The literature review supports the arguments for sustainability concepts, what is project management, who is the project manager, the importance of project management, and the project manager's role and challenges in integrating sustainability concepts into urban development project.

CHAPTER 03

3.0 Research Methodology

3.1 Introduction

This chapter is presented the methodological outline to conduct this research study of the "Challenges in integrating sustainability concepts into urban development projects'. Research design is discussed in this chapter together with research values, the research approach and techniques. The research method will be demonstrated in comprehensively together with gathering on information method along with information (data) evaluation tactic.

3.2 Research Approach

Access to the case study survey presented in Figure 3.1

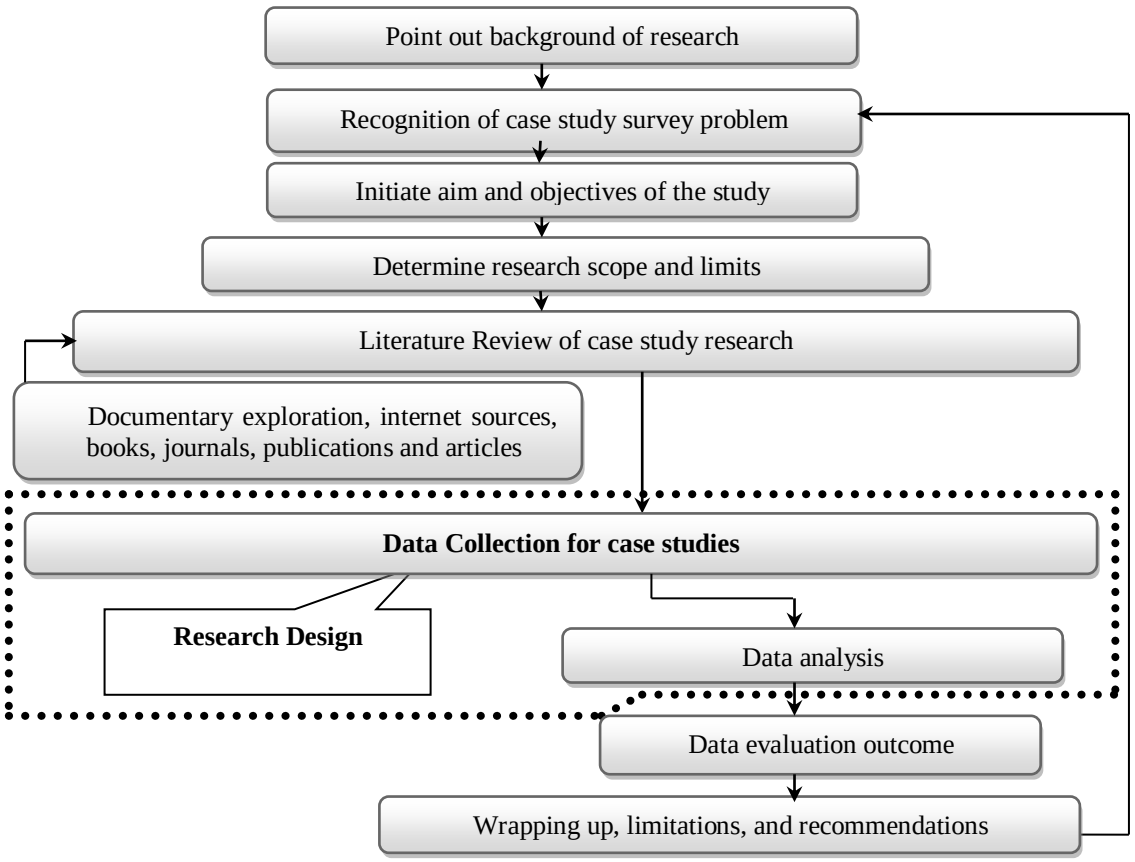

Figure 3.1 Case study research process

3.3 Research Design

The research design outlines the plan from the research question to the conclusion as described in stages concerning this study.

3.3.1 Research Approach

This research is established as a qualitative research and the entire literature was reviewed to gain basic information for the research. The literature review focused for challenges in integrating sustainability concepts into urban development projects in Sri Lanka.

The results of this study should be examined, compute, compare by case to case. Case study researches are taken under quantitative technique. Alternately, using quantitative technique, the researcher is given the opportunity for lessons the entire people as persons or crews, and to explore people's beliefs, views, people's understandings and ideas (Fellows & Lui, 2003) which were not practical in this research case.

In here, case study survey technique carried out under the qualitative approach as the extremely suitable information gathering technique. Professionals who are working at UDA interviewed to collect data for this study. Interviews were conducted by experience skillful people who were associated with selected urban development projects as project managers, architects, engineers, project planners, and facilities managers.

In this research mainly discussed project manager's involvement and PMs role to obtain sustainable urban projects. Instead of project managers other professionals are very supportive to fulfill PMs role successfully and effectively. Therefore, other professionals were used for additional perspectives on PMs for project features.

3.4 Research Techniques

3.4.1 Data Collection Technique

3.4.1.1 Documentary Review

The action plan in 2017 used as a document review as a one of data collection techniques. It is includes all the upcoming activities related to the projects.

3.4.1.2 Preparation for Interviews – Case Studies

The interview guideline of this research was developed to collect data related to the objectives of the study to find solutions for research problem and interviewed guideline were derived from the literature review. (See appendix A).

3.4.1.2.1 Interview Process

The interviews were carried out by experienced professionals in UDA which is related to identified three (03) projects. Acceptance of the interviewee data recorded was conducted to obtain an exact data through the conversation and to reduce misplaced of information. Further, it is difficult to write down all information during the interview process. Finally, interview transcripts were originated to produce discreet versions of the interview data. (Examples of an interview transcript- refer Appendix A). Anyhow, the actual names of the projects were not mentioned to keep the data confidential. The next sector explains the process of analysing data.

In this research, 30 responders contributed for selected three (03) projects. Out of the 30 respondents 15 respondents were project managers. For each case, two (02) project managers were interviewed and other PMs were interviewed to get the general ideas of the project manager's role. Category of the respondents as shown as Table 3.1.

Table 3.1 Category of respondents

Respondents	Quantity	Case 1	Case 2	Case 3	General
Project Managers	15	2	2	2	9
Architects	6	2	2	2	-
Project Planners	4	1	1	2	-
Engineers	3	1	1	1	-
Facilities Manager	2	1	1	-	-

Accordingly, all respondents illustrated as Figure 3.2.

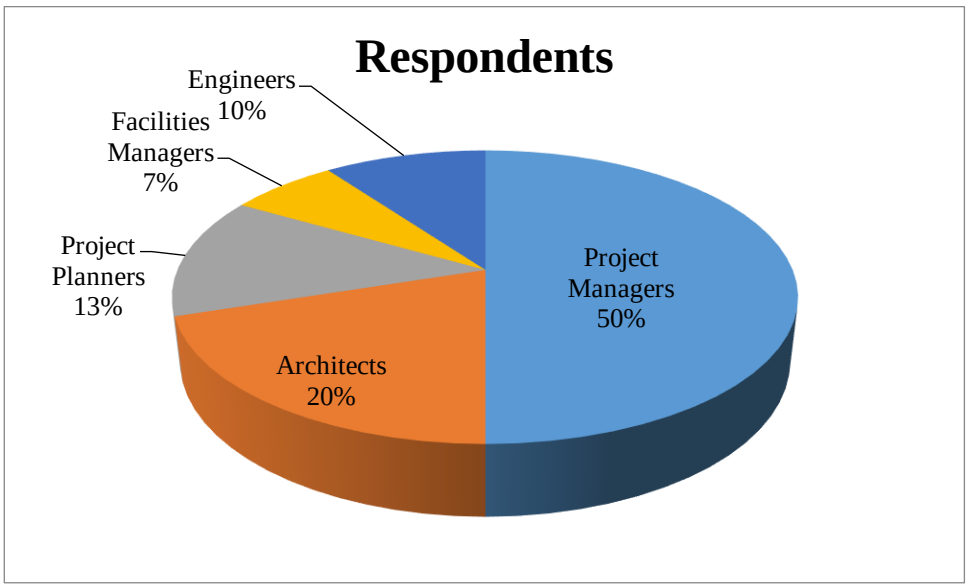

Figure 3.2 Summary of Respondents

3.5 Data Analysis Techniques

Data analysis consists of examining categorizing, tabulating, testing, or otherwise recombining using the three (03) cases. Analysis of case study evidence is especially difficult because the strategies and techniques have not been well defined. Familiarity with various tools and manipulative techniques is helpful, yet every case study should nevertheless strive to have a general analytic strategy defining priorities

for what to analysis and why. In this research, using collected data from expert professional interviews was carried out to identify the project manager's role for sustainable urban development projects in Sri Lanka.

3.5.1 Data Analysis

Later generating the written version of the interview was developed; the keynote procedure was established from the findings of every case scenario. As stated by Perry (1998) these outcomes must be substantiated make use of "cross-case analysis", which is the approach of discovering interconnection and differentiation among each case, and afterward, the conclusions should be made. Therefore, together cross-case and within the case analysis were conducted and outcomes are presented in the next chapter.

3.6 Summary

This chapter was explored about case study research method and the form of the certain lessons. The method was chosen for case study research to explore the challenges in integrating sustainability concepts into urban development projects.

CHAPTER 04

4.0 Analysis, Findings and Discussions

4.1 Introduction

This chapter presents the discussions based on the analysis of the research findings, generated according to the research method given chapter 03. The data collection was done through semi-structured interviews. Then the findings of the cases were analysed considering within the case analysis and cross-case analysis basis.

Thereby the expected outcome of this chapter was reached by explaining the importance of the project manager's role in sustainable urban development projects and challenges in integrating sustainability concepts into urban development projects.

4.2 Background of the Selected Cases

The Urban Development Authority (UDA) in Sri Lanka was established by an Act of parliament bearing No. 41 in 1978 to promote: integrated planning and implementation of economic, social, and physical development of the areas declared by the minister in charge of the subject of urban development. Accordingly, the UDA has been empowered to function as the key urban planning and implementing agency of the country (UDA Action Plan, 2017).

The vision of UDA is "towards planned, sustained and adored urbanisation and the mission is to promote integrated planning and implementation for the economic, social, environmental and physical development of the declared urban areas".

The prime objective of the UDA is to bring systematic changes and development processes in the urban community in Sri Lanka which will ensure that the inhabitants of urban areas become a part of the socio-economic development of the country while maintaining high levels of quality of life.

Urban projects are normally incorporated and may enclose various physical and management modules (Engineering / strengthening of institutions). For certain occasions, urban projects are exceptionally concerned about the societal features of the society. These are people-oriented and intended to support the society. The project's budgetary activities are incomplete as all have been financed from the budget. Further, it affects the project's the fiscal gains and cross-subsidies for the society/and cross-subsidies of the project to the community/threshold people (UDA Act).

When considering selected all three (03) cases (project) that belong to UDA are located in urban areas. Two (02) cases are refurbishment projects and one (01) is a redevelopment project, according to the floating concept which is mainly focusing on the Singapore floating market.

According to the refurbishment concept, these selected projects have become shopping complexes and the other project is redeveloped as a market to sell goods on the floating stalls and boats. The tourist attraction is mainly focused on developing this project in the hub of the western province.

4.3 Case Study Projects

4.3.1 Case Study 01

4.3.1.1 Project Introduction

Project 01 is a shopping complex housed in a group of renovated buildings that consists of four (04) floors in Pettah. This was constructed by getting labour strength of the Sri Lankan Army as per instructions given by former UDA defence secretary. The project summary given in Table 4.1.

Table 4.1. Project details of the case 01

Location	Colombo 11
Opening Date	05th Sep 2014
Developer, Management, and Owner	Urban Development Authority
No. of floors	04
No. of Shops:	83
Floor area:	Sq. Ft. 75,079

4.3.1.2 The Concentration of Sustainability Concept

Project 01 is the renovated project done by the UDA by considering social, environmental, and economical viable. According to the project manager: the environmental benefits of the renovated building arise through the recycling of materials, reuse of structural elements, and the reduction in generating landfill waste, and these factors are converted as cost advantages to the owner and may have broad environmental implications. Apart from that, it makes a significant involvement in low adaptive reuse on reduction and sustainability, by extending the life of an existing building as well as through low usage of material, transport and energy consumption and pollution.

However, this building is economically viable due to existing building space can be rearranged more quickly than new space and restoration and it reduced the financial costs because it took a shorter period to renovate, as well as inflation on construction costs, temporary accommodation costs, and operational costs also reduced. According to the interviews this case is economically viable and has increased the market value of the building. Accordingly, the findings that related project 01 can be summarised under the concentration of the sustainability concept by illustrating in Figure 4.1.

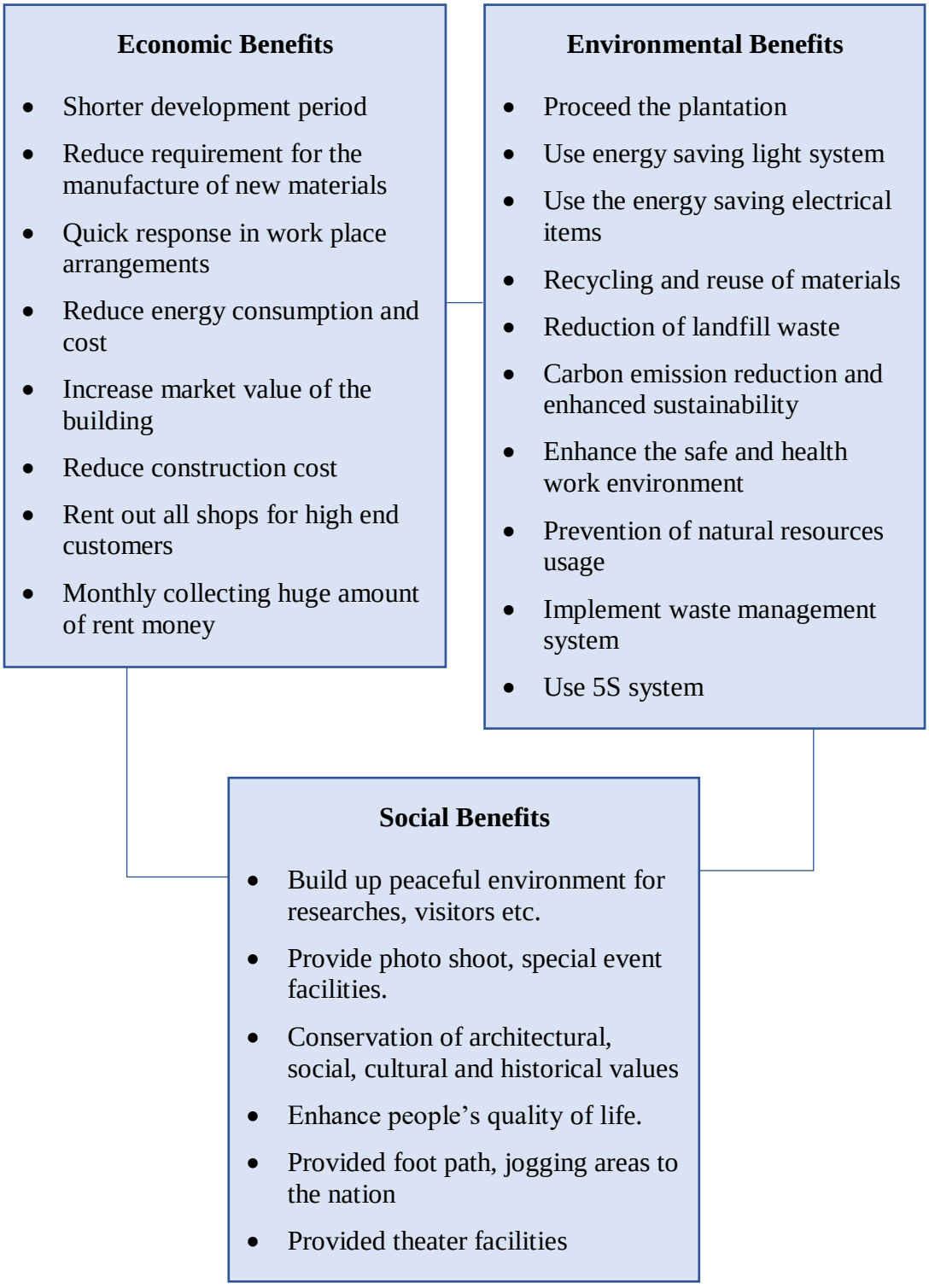

Figure 4.1 The concentration of sustainability concept- Project 1

4.3.1.3 PM Role: Challenges and Solutions in Integrating Sustainability

Core person of the project is project manager. When PM behaves within the project has to perform PMs Role in very effectively and efficiently. However, when the acting PMs role some challenges can arise when integrating sustainability into the project. As the information given by the interviewees, those are the challenges that PMs have been faced during the project and it has categorised under the sustainability concept.

Table 4.2 Challenges and solutions in integrating sustainability for project 1

Challenges	Solutions
Social	
Improve public infrastructure	Develop footpath, jogging areas
Improve Access of sanitary requirements, laying of drainage line, plumbing line, etc.	Get involvement of Colombo Municipal Council
Improve social cohesion	Availability of film theater, increase walking space, increase the historical value of the building, a form of fish tank
Keep the archeological value	Renovated without changing the archeological value
Create a health and calmful environment	Increase the green view, using a very light fabric
Environmental	
Provide access to clean energy and reduce the use of “dirty” energy	Used energy-saving lights like LED, used energy-saving devices, power factor correction, use of electrical sensors, future planning to fix solar panels.
Use of renewable sources	Proposals for the rain-water harvesting

Challenges	Solutions
Improve waste management system	Increase awareness of the importance of waste management and use colour code to identify and implementation of labeling system
Reduce impact on carbon emission	No permission to carbon generate business.
Economical	
Promote economically diversification business	Not limited to the same type of business (Restaurant, Clothing shop, Music instrument related shop etc.) Increase the rentable area, charging system for photo shooter and other promotional activity, Use social media to promote the place.
Recovering of the total cost	Sign the agreement, monthly collecting the services charges, a proposal to wash-room charging system and car park charging system.
Increase public attraction and tourist attraction	Get involvement of tourist board and taking city tour bus with foreign people

Project Manager, the business development manager, project architect, and facility manager reviewed that the increase the public attraction and tourist attraction is one (01) of the major economic challenges of project 01. Because considering all sustainable pillars, project 01 is unable to achieve economic benefits comparing the other two pillars of sustainability. Therefore, recently the authorised body of project 01 concerned economic sustainability. According to that with coordinating with the tourist board hopes to increase tourist attraction. As a result of that, the tourist board decided to change its city tour route and the route was across project 01. When the tourist attraction is increased automatically economic benefits will be increased.

4.3.2 Case Study 02

4.3.2.1 Project Introduction

Project 02 is located in Pettah, a neighbourhood in Colombo, Sri Lanka, consisting of 92 commercial shops, some of trade stalls set for boat services on Beira Lake. This project was established to get local visitors and foreign travelers attraction. The stalls are selling and selling local produce as well handmade crafts.

The success of this project beautification works was carried out by the UDA Rs.150 million. In partnership with the UDA, Engineering section of Sri Lankan army built, constructed Bastian Street, the lane connecting the central bus stand in Pettah and the Colombo Fort railway, into a green background.

As mentioned by the project architect, one (01) of the major challenges for the project manager related to the project was to rearrange unauthorised business off the walking path, mainly in crowded areas like the Pettah, where they had no conveniences and forcing pedestrians onto the road. Mainly consider the traders those who affected by the redevelopment of Bastin. Anyhow, businesses have suffered about small sales and high rental cost. Most of trades people are censured open nature strips of stalls and boats that is impacted to secure their goods during the night time. Therefore, Urban Development Authority is generally performed promotional activities and increases the convenience to enter into the premises. Accordingly, project detail was illustrated in Table 4.3.

Table 4.3 Project details of the case 02

Location	Colombo 11
Opening Date	25th August 2014
Developer, Management, and owner	Urban Development Authority
No of Stalls	92
Floor area	65,340 Sq.ft

4.3.2.2 Concentration on the Sustainability Concept

According to the interviewee's point of view that project 02 achieved sustainable, environmental, and economic benefits when integrating the sustainable concept into the project. As stated by those respondents, project 02 was mainly focused on the social benefits rather than the economic and environmental benefits. This project economically focused on the increases in tourist attraction and increases in land value as well as the building's value. Project two used solar lighting system by thinking renewable energy resources and thinking the value of natural resources and this project was considered social sustainability by allocating social facilities to the society.

According to the findings, project two was environmentally and socially more viable than economically. Accordingly, the concentration of the sustainability concept in Project 02 as illustrated in Figure 4.2.

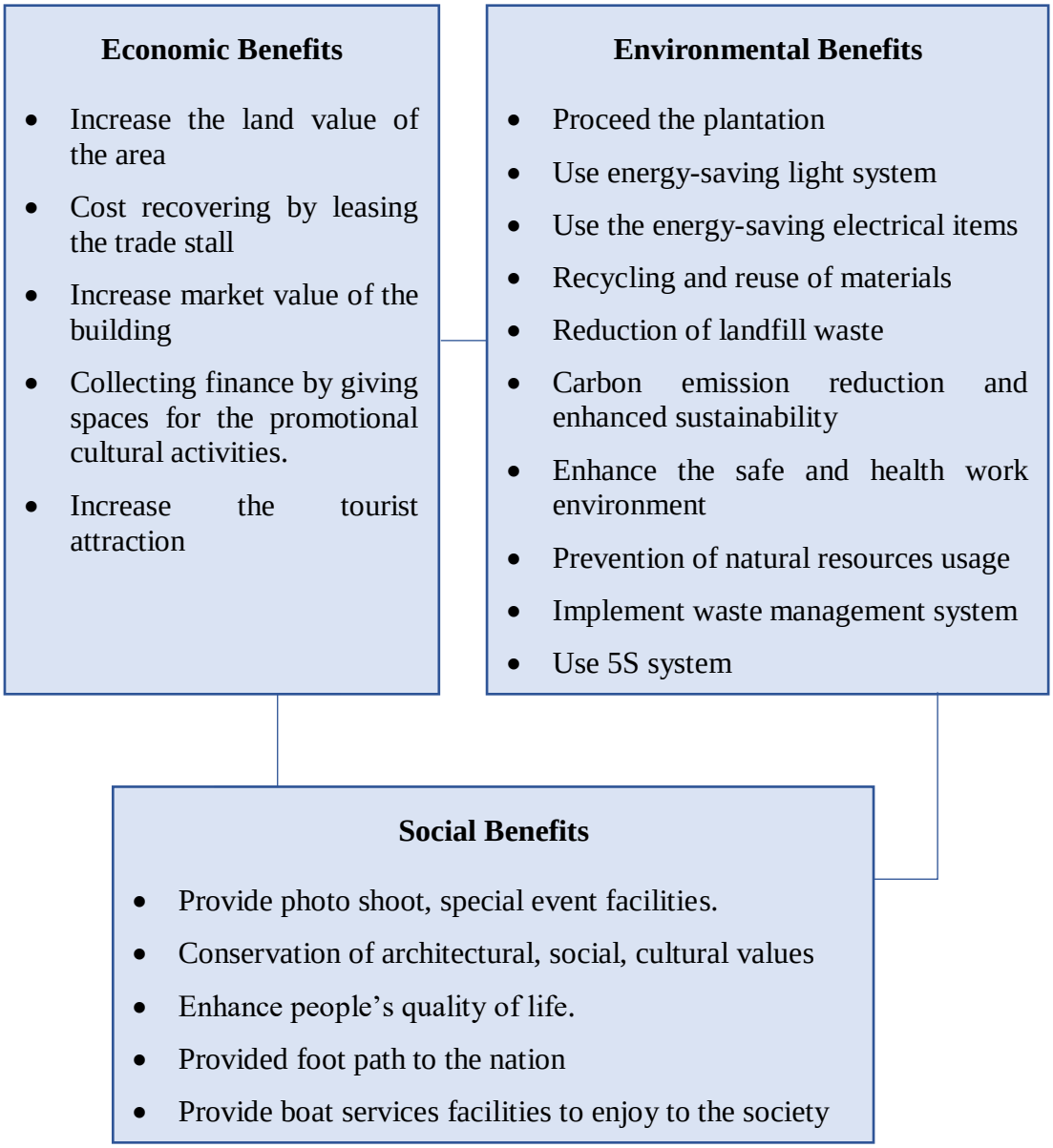

Figure 4.2 The concentration of sustainability concept – Project 2

4.3.2.3 PM Role: Challengers and Solutions in Integrating Sustainability

The perspective of the project respondents of the project stated that the shifting of the street seller towards project 02 premises was the major challenge of this project. However, getting the involvement of defense ministry successfully faced and the challenges have been won. Accordingly, the PM has performed the role by facing below challenges which have illustrated in Table 4.4.

Table 4.4 Challenges and solutions in integrating sustainability for project 2

Challenges	Solutions
Social	
Improve public infrastructure	Develop footpath
Improve access of sanitary requirements, laying of drainage line, plumbing line, etc.	Get involvement of Colombo municipal council
Improve social cohesion	Increase in walking space
Pettah street sellers shifting into the floating market premises	Collecting a small amount for the shop
Development of pettah center point	Shifted traders in the sidewalk into the floating premises
Increase the social well being	Introduced the boat services to enjoy to the families
Environmental	
Accommodate entry to clean energy and decrease the use of "dirty energy"	Used energy-saving lights like LED, used energy-saving devices, power factor correction, use of electrical sensors and use of solar battery lights
Use of renewable sources	Proposals for the rain-water harvesting
Improve waste management system	Increase awareness of the importance of waste management and use colour code to identify and implementation of labeling system
Reduce impact on carbon emission	No permission to carbon generate business
Economical	
Promote economically diversification business	Not limited to the same type of business (Restaurant, Clothing shop, Music instrument related shop, etc.) Increase the rentable area, promotional activity, Use social media to promote the place, Fix digital board and displaying adds
Recovering of the total cost	Sign the agreement, proposals, and implemented to wash-room ticketing system and car park ticketing system.

Increase public attraction and tourist attraction	Get involvement of tourist board and taking city tour bus with foreign people

4.3.3 Case Study 03

4.3.3.1 Project Introduction

This project proposes to face the space scarcity at Sethsiripaya stage 1 and 11. The government of Sri Lanka decided to create the Battaramulla as the hub of all government ministries, other government buildings, and other state-owned institutions. Therefore, UDA decided to build up this project to meet the demand for spaces received from the institutions.

The increase in the number of ministries and the creation of new institutions under such ministries appears to be one (01) reason for the increased demand and to meet the unsatisfied demand at present and in the ministry for Megapolis and Western Development anticipation of increased demand to follow the demand. It was feasible to launch stage 3 of the UDA's building programme and construct, yet another high rise building in its present location at Battarmulla by considering and giving priority for the novel concept for the UDA called green building concept and sustainable concept. The respondents of the project have faced different kinds of challenges at several phases and for different people. This project was in the construction stage. The UDA is more considering sustainability in developing this project and according to the interviews which had conducted with the professionals said that they are focusing to achieve Green Platinum awards.

Table 4.5 Project details of the case 03

Location	Battarmulla
Developer, Management, and Owner	Urban Development Authority
No of floors	25
Floor area	1.3 Milion Sq.ft

4.3.3.2 The Concentration of Sustainability Concept

The green building guidelines and scoring system going to be used for Project 3. Another step will be kept in sustainable development goals through implementing code for stage 03 building and UDA mainly focused to achieve the green platinum award. To achieve Green Platinum awards, the project should score more than 70 out of 100. For the green gold award, the score must be between 60%-69% marks. 50%-59% marks relate to the green silver award and the project can be achieved a green certificate by scoring 40%-49% marks (UDA action plan, 2017).

All those following benefits are focused to fulfil in this project. Under the participants of all professionals, the UDA is expecting to build up Project 03 as a fully sustainable project. Given that, findings getting from the people who interviewed can be categorised under sustainable concepts when performing the role and responsibilities of PMs during the project periods. Those findings illustrated in Figure 4.3.

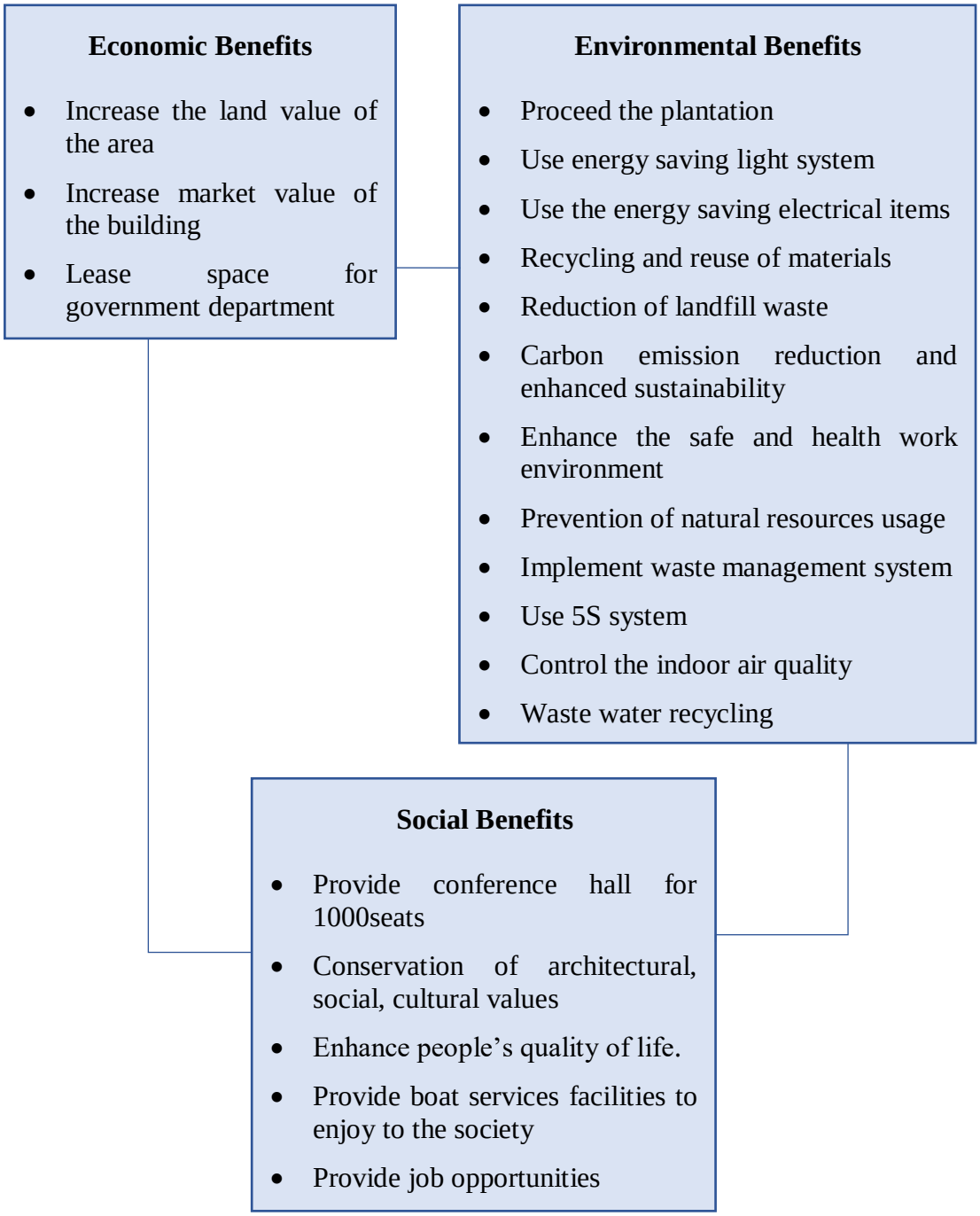

Figure 4.3 The concentration of sustainability concept – Project 3

4.3.3.3 Challenges and Solutions in Integrating Sustainability

According to the interviewed following challenges were identified although, it is under the construction phase and it is not fully completed project. Those challenges explained in Table 4.6 as below,

Table 4.6. Challenges and solutions in integrating sustainability for project 3

Challenges	**Solutions**
Social	
Increase the public parking system	Decided to form 1000 public car parking slots
Improve Access of sanitary requirements, laying of drainage line, plumbing line, etc.	Get involvement of Colombo Municipal Council (CMC)
Improve social cohesion	Increase walking space and proposed to connect with other building by foot-path and in future planned to connect through the bridge
High rules and regulations	Obey the rules and regulation and without violating all standards, rule and regulation planned to build up the building and CIA,SLRDC regulations
Reduce traffic jam in surrounding areas	Hoping to make alternate routes to access all three building belongs to the UDA
Environmental	
Accommodate entry to clean energy and decrease the use of " dirty energy"	Proposed to use energy-saving lights like LED, using energy-saving devices, power factor correction, use of electrical sensors and use of solar battery lights
Use of renewable sources	Proposals for the rain-water harvesting, function of the solar system
Improve waste management system	Introduce a suitable waste disposal method
Decrease effects of greenhouse pollution	No permission to carbon generate business space allow for only the government offices
Facing to floods	The ground floor is not used for rent and that space allowed facing the flooding situation. And the building will be built-up on a stick

Economical	
At the inception stage, there were low rentable areas and it was a challenge to increase the rentable area by reducing open spaces	Changed the design to reduce open spaces
Expert professionals for sustainable development	Hire from the expert from the industry and provide consultancies for the in-house staff. In future form a consultancy agency in UDA
Recovering of total life cycle cost	Develop a market survey and considering total cost decide the per sq.ft rate
Finish to within the UDA allocated budget and the within the time in fully sustainably and greenly	Push up and frequently monitoring the progress of the work to decrease labour expenses and counter inflation

4.4 DISCUSSIONS

4.4.1 Comparison of Project Manager's Role for Sustainable Urban Projects

Project Manager is the core person of any project. In the urban development project PM is acting major role from the begging to end of project. Accordingly, the project manager's role crucial for the initiation, planning, execution, monitoring, and closure phases. Sometimes PM struggles with all these phases. Because, Urban Development Authority (UDA) is public organisation and political influences are very high. Due to this PM get stuck when performing the PMs role. However, the Table 4.7 shows the project manager's action towards integrating sustainability to urban development projects.

Table 4.7 – Project Manager's action towards integrating sustainability to urban development projects

Project management phases	**Project manager's action towards integrating sustainability to urban development projects**		
	Project 1	**Project 2**	**Project 3**
Initiation	▪ Involvement of proper cost estimate ▪ Proper detailed design ▪ Appropriate action period of evaluation ▪ Act against to the political participation and stress in choosing the project ▪ Manage the allocated budgets (Due to insufficient funds and high percentage of useless effort for getting approval for projects)		
Planning	▪ Communicate with stakeholders ▪ Proper quality management and planning ▪ Develop proper communication management among the people who involve to the project ▪ Active involvement of feasibility study ▪ Involve to selecting project team when there is no written policy ▪ Involve to hire skilled staff ▪ Active participation when contractor not following the administrative system		
Execution	▪ Strong strength to face scope changes ▪ Handle the situation of insufficient resources, tools and with poor data management ▪ Efficiency involvement when there is no proper methodology to carried out the projects		
Monitoring	▪ Develop good communication system ▪ Face to the corruptions ▪ Face to the favoritism matters instead of professionalism		
Closing	▪ Discussion with board members about final stage ▪ Consider project objectives and aims are achieved ▪ Invite to relevant parties for project ending process ▪ Present to the political members about the project		

4.4.2 Principles and Guidelines Used in Integrating Sustainability

The green building guidelines have been examined at all stages of the project (Urban Development Act, 2017). Especially in the project 03 use seven (07) guidelines in Table 4.7

Table 4.7. Guidelines of project 3

Guidelines	Activities
Energy-efficiency related guideline	According to the findings of case study 3 for energy efficiency, it has planned to use energy management activities such as, ▪ Light open by zone to zone and by the zoning of lighting source. Use of Electrical sub-metering system. ▪ Use of high-performance energy efficiency lamps and light. ▪ Use of efficiency electric illumination. ▪ Consider the power factor correction and keep it 0-1 range. ▪ Proceed the sustainable maintenance activities.
Sustainable site planning and management	▪ Arrangement of action to manage the environment and plan for secure environment. ▪ Placing and enhancement of natural field cover. ▪ Mitigate building pollution. ▪ Improve workers' facilities. ▪ Consider quality assurance in building construction ▪ Improve the parking capacity and provision of a fully complete parking facility with a coding system under the 5S concept. ▪ Rainwater drainage plan and usage of rain-water
Building materials and resources management	▪ Use recycling and reuse materials ▪ Use of locally existing resources for the building ▪ Use wooden materials as sustainable ▪ Practice the proper waste disposal program. (Practice with good quality greenhouse resources) ▪ Carrying on the construction waste management program properly ▪ Use of green products
Quality of interior environment of the building	▪ Put an end to indoor air pollution ▪ Managing the CO_2 level ▪ Designing to use optimum heat manage switches

Guidelines	Activities
	▪ Circulation of air effectively inside the building ▪ Use of maximum efficiency of visual light system and sounds. (day light saving, control electrical light level, control the glare of intake sunlight) ▪ Plan to manage the inside sound system ▪ Develop the external and internal background ▪ Control the internal noise level
Water efficiency	▪ Use of rainy water harvesting and water recycling system ▪ Hopes to use water efficiency tools and equipment ▪ Use of water leak identification tool
Green innovation	▪ Exploitation of innovation
Socio-cultural compatibility	▪ Create social and cultural appropriate building style

Above all green buildings, guidelines are to be used for case study project 03 to achieve a score of more than 70% marks to get the green platinum. When integrating sustainability concepts into the projects faced some challenges such as lack of expert professionals known about sustainability, instability of the government, high political influence, a longer period for taking approval, and less awareness of the new technology.

To achieve the project objectives (design a fully sustainable and green project) at an optional level should be carried out principles and guidelines. The principles are on reducing the use, re-using, and re-cycling, there has a principle of proper intention as a contribution, agreement, responsibility, clearness, and competence, and efficiency, commitment to rule of law, impartiality and quality. Accordingly, create principles for the prevention of environmental pollution and develop precautionary principles of environment protection and conservation.

Considering the green building guidelines for Sri Lanka (2017), the project has identified the importance of the formulation of some guidelines such as policy

guidelines, technical guidelines, economic guidelines, legal guidelines, social, economic, cultural and health guidelines.

The exact duties of a project manager will have based on industry, organisation, and the types of projects that a PM is tasked with overseeing. However, in a traditional project management role, the objective is to complete a project successfully, while remaining on time and within the given budget. Further Project managers have the potential to shape an organisation's path, helping to reduce costs, maximise company efficiencies, and increase revenue by considering five phases of projects and considering project life cycle. Traditional PM role and the sustainable PM role bit different. Sustainable concept is broader concept and in the sustainable concept PMs have to mainly consider economic, environmental, and social sustainable pillars when integrating to sustainable urban projects.

According to the respondent's point of view, the application of guidelines for green buildings must be incorporated with the annual plans and plans of action of the UDA within the given time frame.

4.5 Summary

This chapter discussed date collecting evaluation and result for each and every case. Further, explored the principles and guidelines used in integrating sustainability in urban development projects.

CHAPTER 05

5.0 Conclusions and Recommendations

5.1 Research Objectives

5.1.1 Objective 1: Critically review the significance of the project manager in sustainable urban development project management

The sustainable project management is the management of project, organized change in policies, assets, or organizations, with consideration of the economic, social, and environmental impact of the project, its result and its effect, for now, and future generations. Accordingly, critically reviewed the role of PMs in integrating sustainability into projects and explained the current practices of PMs in delivering sustainable urban development projects through literature review, expert professional interviews carried on during the data collection period.

With such background, this study shows the importance of project management for urban development projects in integrating sustainability in all phases of a project. Some project managers' roles are most important during the project as established project objectives, interpretation of the client, final user understanding, appraisal techniques and mechanisms, time period, presenting, and collaborating, direction-finding techniques, finances and finally procurement system.

Further, this study explained the project manager's role in sustainable urban development projects. When performing a project manager's role faced some challenges and due to the additional attention to sustainable construction these challenges are present. Fees, excellence, and timing are concentrated in any project while minimising of material decreases, deterioration of the environment, and making a strong atmosphere are additional basis, which is appraised in the sustainability concept.

5.1.2. Objective 2: Appraise the requirements of sustainable concept integration to urban development projects.

When integrating the sustainable concepts into urban development projects, some key requirements must be considered by the project manager at the stages of the project as initiating, planning, and execution, monitoring, and closing with considering social, economical, and environmental requirements.

Some sustainable features have added and proposed to the urban development projects as recycling and reuse of materials, use energy efficiency electrical system, rainwater harvesting, 5s system, etc. In the non-sustainable projects are difficult to notice these sustainable features. Because of the non-sustainable projects only consider present relaxation and do not consider future generation needs. Due to resource scarcity, resources availability is most crucial for future generations as well. Therefore, now urban development authority is more concerned about the requirements of sustainable concept when integrating it into the urban projects.

5.1.3 Objective 3: Explain the challenges for the project manager's role in sustainable urban projects

As stated by the professionals the UDA project has faced some challenges when carried project management under the sustainable concept. Case study project 3 is still in the design faced and its challenges were faced at this stage. Out of the other two (02) of projects, project 01 is building, renovating considering the sustainability concept. However, the achievement of sustainability did not stop, although, that project has built, at the operational phases they are more concentrated on the sustainability concept and for the development of sustainability doing some sustainable development program such as, waste management activities, plantation, energy management activities, etc.

From the research findings, the third case study project has fulfilled the goal and aim of the project, although; the operational side is not in a proper manner. According to the research findings, the project should have operationally sustainable furthermore,

and it is challenging and there are some issues when developing sustainability, such as less awareness of the customers, who are coming to visit the premises. Because it is located in the hub of the Colombo area and most of the people are less aware of the sustainable concept. People who are visiting the premises not think about the waste management concept, energy conservation etc.

Several benefits including environmental, economic, health, safety, and community benefits can be achieved throughout the selected urban projects. All together these benefits lead to reduce operational costs and make the building sustainable.

5.1.4 Objective 4: Describe the responsive role of the project manager in addressing the challenges of integrating sustainability into urban development.

As described in the findings chapter various advantages together with economic, environmental, health, safety, and community benefits can be achieved throughout the selected urban projects. Entirely these advantages guide to minimise running costs and build the building sustainable. When integrating sustainability concepts for the selected cases, the project manager faced some challenges and has to find a solution for the challenges to achieving the project aims. Keep the archeological value, improve waste management system, recovering of the total cost, use of renewable sources, and finish to within the UDA allocated budget and within the time in fully sustainable and greenly are some main challenges faced by project managers. In the findings chapter table 4.2, 4.4, and 4.6 are showed challenges and solutions faced by PM when integrating sustainability concepts into urban development projects.

Finally, it can be concluded that a renewed approached to project management is more important in sustainable urban development projects. Because UDA is the public sector organisation and it has high political influences, long approval process, more documentations required for the process, and lack of expert professionals.

Therefore, at the initial stage, PMs should plan all these and it is challenging role of project managers.

Recommendations

Therefore, underneath recommendations are suggested as an outcome of this study.

- The project design shall include a detailed schedule.
- Accurate expenditure evaluation needs to be taken into place.
- Recognition of shareholders at the incepting stage.
- Collaboration among the various public sector institutions.
- Detailed method must be designed prior to begin the project.
- Highest quality of project leader (Project manager).
- Keep remaining the project leader until project is in progress.
- System-oriented observation procedure.
- Establish risk management.
- The formation of a committed project management office with facilitating the skilled manpower (lack of skilled professionals)
- Get the involvement of facilities management professionals in the planning stage.

5.2 Scope and Limitations

The area of this study is to discover challenges in integrating sustainability concepts into urban development projects. The scope was successfully covered by the expert survey and getting details from the selected case studies as the outcome.

There were limitations to carry out the research such as, limited-time length; inadequate details to conduct research and less availability of experienced professionals. Most of the professionals did not have both adequate experience and theoretical knowledge of sustainability projects. Further, the UDA has attended to less number of sustainable development projects because it was a novel concept to the UDA. The above limitations created barriers to this study and its limits the interview guidelines.

5.3 Further Research Directions

There have several areas for future studies in this contentment. Since, it is a novel concept in urban development projects as well as considering the entire life cycle of green building and shareholders elaborated in different stages. A few possibilities that are relevant to this research are proposed as below,

- Green building concept to adaptive reuse of historic buildings in Sri Lanka.
- Risk management of refurbishment project in Sri Lanka.
- The best profitable option related to adaptive reuse vs. demolition of the renovate projects in the Urban Development Authority in Sri Lanka.
- Operational challenges of commercial projects under UDA.

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APPENDIX A:

INTERVIEW GUIDELINES

The information collected from this interview will only be used in the fulfillment of the requirements of Dissertation for the Master of Science in Project Management in University of Moratuwa. The interviews will be conducted with professional who are involved to Urban Development Projects.

Introduction to the interview

Urban Development should be guided by a sustainable planning and management vision that encourages interconnected green space, a multi-modal transportation system, and mixed-use development. All various public and private partnerships should be used to create sustainable and livable communities that protect historic, cultural, and environmental resources. In addition, policymakers, regulators, and developers should support sustainable site planning and construction techniques that reduce pollution and create a balance between built and natural systems.

New sustainable urban development or re-developments should provide a variety of commercial, institutional, educational uses as well as housing styles, sizes, and prices. The provision of footways, tracks, and private streets, connected to transit stops and an interconnected street network within these mixed-use developments provides mobility options and helps reduce pollution by reducing vehicle trips. Walking, bicycling, and other mobility options should be encouraged throughout the urban mixed-use core and mixed-use neighborhoods with easily accessed and well-defined centers and edges. However, when carrying on development have to have faced different kind of challenges and finally it is big responsibility to find solutions for all.

INTERVIEW GUIDELINESFOR CASE STUDY

Name:

Designation:

Experience in years:

1. Can you explain briefly about your position and role?
2. Are you aware of the sustainability concept? And green building concept?
3. Are you thinking about the green building concept that is the part of the sustainable concept?
4. Do you think sustainability concept is novel concept for urban projects?
5. Can you explain about this project?
6. Is this project constructing under green building or sustainable building concept?
7. If yes, explain if briefly of such features?
8. How do you assure that your project has achieved sustainability under these three pillars of the sustainability? Can you explain it separately?
    a) Economic sustainability
    b) Environmental sustainability
    c) Social sustainability
9. Does the management is aware about the energy efficiency concepts? What are the factors considered under the energy efficiency?
10. Are your project has considered the sustainable site planning and management?
11. How do you use building materials and resources in sustainably?
12. How do you measure quality of environment of the building?

13. What are the strategies that you have used when integrate sustainability?
14. What do you mean water efficiency of the project?
15. Are you followed following guidelines for project?
    a) Policy Guidelines
    b) Technical Guidelines
    c) Legal guidelines
    d) Economic guidelines
    e) Socio-economic, cultural and health guidelines
16. Do you have a plan to achieve any awards after implementing of the sustainable concept for urban projects?
17. What kind of awards are you expecting? What are the things you have done to get awards?
18. Can you explain practical difficulties that you faced during the project period in integrating sustainability aspects?
19. Is it difficult to bring the sustainable concept for existing project? If yes, what are the reasons for that?
20. What are the project manager's roles in integrating sustainability? Why it is important for projects?
21. How do you overcome those challenges?
22. What are the standards followed to achieve sustainability in this project?
23. Can you explain briefly each and every standard you have followed and you have not followed or standards that you are going to be achieved in future?
24. Do you think sustainable development is important for urban development projects? Explain it briefly
25. Can you explain briefly about your experience and expertise in relation to sustainable construction?

26. What are the changes that it brings to projects when sustainability is integrated?
27. What are the common project manager's challenges when integrate the sustainability concept into existing projects? Can you explain those challenges under the environmental, social, and economical?
28. Do you have ideas how to overcome those challenges/barriers?
29. What is the procedure of integrating sustainability concept into existing projects?
30. What are the different between sustainable and non-sustainable urban projects?

Date:

Duration of interview: